

Phylum **Xenacoelomorpha**^{1 2} Philippe et al. 2011 (2 subphyla)
 Subphylum **Xenoturbellida** Westblad, 1949 (1 family)
 Family **Xenoturbellidae** Westblad, 1949 (1 genus, 2 species)
 Subphylum **Acoelomorpha**³ Ehlers, 1985 (2 classes)
 Class **Nemertodermatida**⁴ Karling, 1940 (2 families)
 Family **Ascopariidae** Sterrer, 1998 (2 genera, 4 species)
 Family **Nemertodermatidae** Steinböck, 1930 (4 genera, 5 species)
 Class **Acoela**⁵ Uljanin, 1870 (16 families)
 Family **Diopisthoporidae** Westblad, 1940 (1 genus, 5 species)
 clade **Bitesticulata** Jondelius, Wallberg, Hooge, and Raikova, 2011
 Family **Paratomellidae** Dörjes, 1966 (2 genera, 3 species)
 clade **Bursalia** Jondelius, Wallberg, Hooge, and Raikova, 2011
 clade **Prosopharyngida** Jondelius, Wallberg, Hooge, and Raikova, 2011
 Family **Hallangiidae** Westblad, 1946 (2 genera, 2 species)
 Family **Hofsteniidae** Bock, 1923 (3 genera, 6 species)
 Family **Solenofilomorphidae** Dörjes, 1968 (5 genera, 10 species)
 clade **Crucimusculata** Jondelius, Wallberg, Hooge, and Raikova, 2011
 Family **Dakuidae** Hooge, 2003 (3 genera, 21 species)
 Family **Isodiametridae** Hooge and Tyler, 2005 (22 genera, 90 species)
 Family **Otocelididae** Westblad, 1948 (5 genera, 9 species)
 Family **Proporidae** Gra?, 1882 (14 genera, 62 species)
 clade **Aberrantospemata** Jondelius, Wallberg, Hooge, and Raikova, 2011
 Family **Convolutidae** Gra?, 1905 (24 genera, 114 species)
 Family **Mecynostomidae** Dörjes, 1968 (11 genera, 32 species)
 Family *incertae sedis* **Actinoposthiidae** Hooge, 2001 (10 genera, 22 species)
 Family *incertae sedis* **Antigonariidae** Dörjes, 1968 (1 genus, 1 species)
 Family *incertae sedis* **Antroposthiidae** Faubel, 1976 (3 genera, 3 species)
 Family *incertae sedis* **Nadinidae** Dörjes, 1968 (1 genus, 3 species)
 Family *incertae sedis* **Tauridae** Kostenko, 1989 (1 genus, 1 species)

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1. **BY** Seth Tyler and Stephen Schilling (For full authors' address, see after References Cited.) The title of this contribution should be cited as "Phylum Xenacoelomorpha Philippe, et al., 2011. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness". At the time this was compiled, the Xenacoelomorpha comprised 2 subphyla, 2 classes, 19 families, 115 genera, and 395 species. These are taxa formerly classified in the Class Turbellaria of the Platyhelminthes, which is now recognized to be paraphyletic and polyphyletic. (See also: <http://turbellaria.umaine.edu>)
 2. Both molecular and ultrastructural data tie *Xenoturbella* to the Acoelomorpha (see Franzén and Afzelius 1987, Lundin 1998, Philippe *et al.* 2011), and because of the long-recognized deuterostomian characters of *Xenoturbella* (Reisinger 1960, Bourlat *et al.* 2003, Telford 2008), placing the Acoelomorpha, as well, in the Deuterostomia or as sister group to it has been a possibility (Tyler, 2001). The most recent genomic phylogeny (Philippe *et al.* 2011) ties *Xenoturbella* and Acoelomorpha as sister groups composing the clade Xenacoelomorpha, which is ranked as a phylum of Deuterostomia, sister group to the Ambulacraria (phyla Echinodermata and Hemichordata); Xenacoelomorpha + Ambulacraria are together sister group to the phylum Chordata.
 3. The relationship of the Acoelomorpha to the phylum Platyhelminthes is a matter of controversy (Egger *et al.* 2009). A strong morphological character, in the nature of stem cells, unites Acoelomorpha and Platyhelminthes, but molecular phylogenies— whether from just a single molecule, such as 18S rDNA (Ruiz-Trillo *et al.* 1999), or from larger datasets on a genomic scale (Phillipe *et al.* 2011)—place the Acoelomorpha outside of the Platyhelminthes. That phylum occupies an uncertain position in the Lophotrochozoa (see Giribet 2008).
 4. Sterrer (1998)
 5. Classification following Dörjes (1968), Hooge *et al.* (2002), Jondelius *et al.* (2011)

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